

APPENDIX A

Resume of Torben Aabo

Torben Aabo
Principal Engineer

Torben Aabo received a Bachelor's Degree in electrical engineering from Aarhus Technical College, Denmark, in 1967 and has done graduate work in electrical engineering and industrial management at Fairleigh Dickinson University.

He joined Phelps Dodge Cable and Wire Company (now BICC) in 1970 and his early assignments were in the Extra High Voltage Research Laboratory in dielectric and thermal test and analysis of 500 kV pipe-type and 138 kV solid dielectric cable systems. In the Cable Application and Systems Engineering Department, he participated in design, specification, installation, and cost analysis of transmission cable systems into the EHV range.

Mr. Aabo joined Power Technologies, Inc., in 1974 and participated in the design of many pipe-type and solid dielectric transmission cable circuits. He was the project manager of several 115 and 138 kV transmission cable projects from the initial cost evaluation, bid specifications, pre-bid meetings, supplier evaluation, EMF issues, and factory inspections, through the final acceptance of the cable circuits. He also inspected cable and accessories prior to customer acceptance.

Mr. Aabo was one of the principal investigators in a research project to increase pipe-cable section length. During research of leak location methods for underground cables, he developed one method for locating leaks in fluid-filled pipe-type cable systems, now a commercial product available to the industry. Mr. Aabo was responsible for implementing, monitoring, and calculation methods that allow the calculation of conductor temperature based on field generated data.

Mr. Aabo was responsible for a reliability and failure evaluation of a 138 kV solid dielectric cable circuit. This study involved evaluation of system operation, joints, terminations, and substation equipment. He also evaluated several critical cable circuits for domestic and foreign industrial corporations and recommended operating procedures and system improvements to extend the cable and accessories' useful life. He has participated in numerous investigations of cable and accessory failures, both in distribution and transmission systems.

He was a principal instructor for PTI's Underground Cable Systems and Cable and Accessory Failure Analysis Courses. These courses were presented yearly from 1980 through 1994. He also developed a short-course on Extruded Dielectric Transmission Cables.

Mr. Aabo is a member of IEEE and a voting member of the Insulated Conductors Committee. He is the chairman of working groups involved with development of transmission cables 60 kV and above and reports of cable failures 69 kV and above.

In May 1995, Mr. Aabo formed Power Cable Consultants, Inc., a company specializing in engineering projects pertaining to underground transmission and distribution cable systems. He is also involved with failure investigations of transmission and distribution cables and their accessories.

Torben Aabo
TECHNICAL PUBLICATIONS

1. "Forced Cooling Tests on 230 kV and 345 kV HPOF Cable Systems," IEEE Winter Power Meeting, New York, NY, 1976, Paper A76 201-4, (co-authors, J.A. Williams and E.D. Eich).
 2. "Thermal Analysis of 230 kV and 345 kV HPOF Cables," IEEE 1976 Underground Transmission and Distribution Conference, Atlantic City, NJ, September 1976, (co-authors, J.A. Williams and E.D. Eich).
 3. "Increasing Pipe Cable Section Lengths," 7th IEEE/PES Transmission and Distribution Conference, Atlanta, GA, April 1978, (co-authors, J.A. Moran and J.F. Shimshock).
 4. "Cell Tests for Dielectric Performance of Glass," 7th IEEE/PES Transmission and Distribution Conference, Atlanta, GA, April 1978, (co-authors, J.A. Williams and K.R. Kormanyos).
 5. "Thermo-Mechanical Bending of Pipe Type Cables," PTI Newsletter, *Power Technology*, Issue 30, July 1982.
 6. "Thermo-Mechanical Bending Effects in EHV Pipe-Type Cables," IEEE/PES 1984 T&D Conference, Kansas City, MO, April 29 - May 4, 1984, (co-authors J.A. Moran and J.F. Shimshock).
 7. "Pressure Surge Reflector for Pipe Type Cable System," Paper 89 TD 369-0 PWRD, presented at the IEEE/PES T&D Conference, New Orleans, LA, April 2-7, 1989, (co-authors, H. Chu, H.A. ElBadaly, R. Ghafurian, R.J. Ringlee, J.A. Williams, and J. Melcher).
 8. "Pulling Pipe Type Cables," presented at the EPRI Cable Pulling Workshop, New Orleans, LA, October 10-11, 1989, (co-author, J.A. Moran).
 9. "A Fourier Transform Technique for Calculating Cable and Pipe Temperatures for Periodic and Transient Conditions," IEEE Paper No. 91 WM 248-5 PWRD, IEEE/PES Winter Meeting, New York, NY February 3-7, 1991, (co-authors, G. C. Thomann, E. C. Bascom, R. Ghafurian, and T. M. McKernan).
 10. "Pressure Surge Testing of Pothead and Joint for Pipe Type Cable Circuits," IEEE/PES 1991 Transmission & Distribution Conference, Dallas, TX, September 22-27, 1991, (co-authors, J. A. Williams, R. J. Ringlee, H. Chu, and R. Ghafurian).
 11. "Field Test Program and Results to Verify HPFF Cable Rating," IEEE/PES 1991 Transmission & Distribution Conference, Dallas, TX, September 22-27, 1991, (co-authors, J.A. Williams, E.C. Bascom, and B. Horgan).
 12. "Laboratory Analysis of Failed Samples: What is Important?" presented at a panel session "Cable, Joint and Termination Failure Analysis" during the IEEE/PES 1991 Transmission & Distribution Conference, Dallas, TX, September 22-27, 1991.
 13. "Underground Transmission Cables: Cost Effective Ampacity Improvements." PTI's Newsletter, *Power Technology*, Issue No. 75, October 1993, (co-author, W. G. Lawson).
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14. "Upgrading the Ampacity of HPFF Pipe-Type Cable Circuits," IEEE/PES 1994 Transmission and Distribution Conference, Chicago, IL, April 11-16, 1994 (co-authors, W. Graham Lawson, Sunil V. Pancholi).
15. "Hybrid Transmission: Aggressive Use of Underground Cable Sections with Overhead Lines." 36th CIGRE Session, 25-31 August, 1996 (co-authors, E.C. Bascom, III, D.A. Douglass, and G.C. Thomann).
16. "Diagnostic Testing of Cable Systems," Presented at the Pennsylvania Electric Association T&D Committee Meeting, September, 1996 (co-author, Edwin Pultrum).
17. "Testing of XLPE Transmission Cable Terminations at Three Utilities," EPRI Report TR-108073, Final Report, May 1997 (Co-author, Edwin Pultrum).
18. "Directional Drilling Installation of Transmission Cable & Fiber Optic Circuit," Presented at the 1997 T&D World EXPO, Atlanta, Georgia, November 11 - 13, 1997 (co-author, Isaac Green).
19. "Diagnostic Tool for Distribution Cables: VLF Partial Discharge Detection," Presented at the 1997 T&D World EXPO, Atlanta, Georgia, November 11 - 13, 1997 (co-author, Willem Boone).
20. "Cost Effective Maintenance of Distribution Cable Circuits Using Diagnostic Testing," Presented at the 1998 Doble Conference, Boston, Massachusetts, March 30 - April 3, 1998 (co-author, Willem Boone).

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